CHAPTER 1

Introduction

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

EUGENE DISTRICT
Upper Siuslaw
Late-Successional Reserve
Restoration Plan
2003

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Location of the Upper Siuslaw Late-Successional Reserve Restoration Planning Area

D03-01-03:PF:061903

Introduction

This Environmental Impact Statement (EIS) analyzes alternatives for a plan for forest and aquatic ecosystem restoration within a Late-Successional Reserve (LSR 267) in the upper portion of the Siuslaw River Watershed in the Coast Range Mountains, west of Eugene, Oregon. The proposed plan would be a 10-year management approach and contain specific actions needed to achieve the LSR goals and Aquatic Conservation Strategy objectives set out in the Northwest Forest Plan.

The National Environmental Policy Act (NEPA) of 1969, as amended, requires Federal agencies to consider environmental consequences in their decision-making process. The Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis (40 CFR 1500). The environmental impact analysis process, as governed by the Department of the Interior Departmental Manual 516, *NEPA Compliance*, and BLM Manual H-1790-1, *National Environmental Policy Act Handbook*, is the mechanism by which BLM ensures its decisions are based on an understanding of potential environmental consequences. Preparation of this EIS must precede a final decision regarding the selection of an alternative, and must be available to inform the decision-maker and the public of potential environmental consequences. The development of this EIS allows for public consideration and input concerning the proposed restoration plan, and will provide to the decision maker and the public the information required to understand the future environmental consequences of the alternatives. After completion of this EIS, BLM will issue a Record of Decision which will select the alternative that will be implemented.

Background

The Northwest Forest Plan created a network of LSRs to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species, including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (USDA and USDI, April 1994, pp. C-9 - C-11). The Northwest Forest Plan directs that a management assessment be prepared for each LSR before habitat manipulation activities are designed and implemented (USDA and USDI, April 1994, p. C-11). BLM and the Forest Service prepared an LSR Assessment for LSR 267 in 1997 (USDA and USDI 1997).

The Northwest Forest Plan also developed an Aquatic Conservation Strategy to restore and maintain the ecological health of watersheds and aquatic ecosystems. One component of the Aquatic Conservation Strategy is a network of Riparian Reserves along rivers, streams, and other hydrologic features. Riparian Reserves are portions of watersheds where riparian-dependent and stream resources receive primary emphasis (USDA and USDI, April 1994, pp. B-12 - B-17). The Northwest Forest Plan directs that a watershed analysis be prepared to serve as a basis for project proposals, and monitoring and restoration needs for a watershed (USDA and USDI, April 1994, pp. B-20 - B-21). BLM prepared a watershed analysis for the Siuslaw River Watershed in 1996 (USDI BLM 1996a).

The network of Riparian Reserves overlap the LSRs. The Northwest Forest Plan explains that these overlapping land use allocations work together:

> *"The standards and guidelines under which Late-Successional Reserves are managed provide increased protection for all stream types. Because these reserves possess late-successional characteristics, they offer core areas of*

high quality stream habitat that will act as refugia and centers from which degraded areas can be recolonized as they recover." (USDA and USDI, April 1994, p. B-12).

General Location

LSR 267 lies almost entirely within the Siuslaw River basin in the Oregon Coast Province, with a very small portion in the Umpqua River basin. LSR 267 includes 175,280 acres of federal land managed by the BLM Eugene, Roseburg, and Coos Bay Districts and the Siuslaw National Forest (see Map 6). The Eugene District manages approximately 83,000 acres (47%) of LSR 267. Of this total acreage, 24,400 acres are within the Upper Siuslaw River sub-unit (14% of LSR 267), which will be addressed by this restoration plan. BLM hopes to develop similar restoration plans in the future for the other sub-units of LSR 267: Middle Siuslaw River, Wolf Creek, and Wildcat Creek (see Figure 1).

The area of this proposed restoration plan, the Upper Siuslaw River sub-unit of LSR 267, extends from the eastern edge of LSR 267, just west of the Lorane Valley. The Upper Siuslaw sub-unit extends west to Oxbow Creek (see Map 6). The northern boundary is defined by the ridge between the Siuslaw and Wolf Creek watersheds. The southern boundary is defined by the boundary between the Eugene and Roseburg Districts, which approximates the ridge between the Siuslaw and Umpqua River basins (although a very small portion of the Upper Siuslaw sub-unit of LSR 267 extends into the Umpqua River basin). This area will be referred to hereafter as "the planning area" and encompasses only the BLM-managed Late-Successional Reserves within the above boundaries. Many of the graphs and tables in this EIS address only the portion of the planning area that is ≤80 years old (13,800 acres).

Purpose and Need

The purpose of the action is to:

- protect and enhance late-successional and old-growth forest ecosystems;
- foster the development of late-successional forest structure and composition in plantations and young forests; and
- reconnect streams and reconnect stream channels to their riparian zones and upslope areas.

This action will be consistent with the decisions of the *Eugene District Resource Management Plan* (RMP) and will address the recommendations of the *Late-Successional Reserve Assessment for the Oregon Coast Province - Southern Portion – RO267, RO268* (LSR Assessment) and the *Siuslaw Watershed Analysis*.

The need for the action is established in the FSEIS for the Northwest Forest Plan, which concludes that young plantations are unlikely to follow natural stand development pathways toward late-successional conditions if left untreated; that the loss of in-stream large woody debris has reduced aquatic habitat complexity; and that badly designed or damaged roads and culverts are degrading aquatic habitat quality (USDA and USDI February 1994, pp. 3&4-49, 3&4-54, 3&4-59).

The need for the action is also established in the Eugene District RMP, which directs that we restore and maintain the ecological health of watersheds and aquatic ecosystems (USDI BLM 1995, p. 18); that we plan and implement LSR projects that are beneficial to the creation of late-successional habitat; and that we improve conditions for fish, wildlife, and watersheds (USDI BLM 1995, pp. 30-31).

The need for the action is also established in the LSR Assessment, which defines management triggers, criteria, and appropriate activities within the LSR (USDA and USDI 1997, pp. 42-46). The LSR Assessment explains:

> *"Dense uniform conifer stands in managed plantations (25-50 years) will be the primary focus for manipulating vegetation to provide the structural conditions associated with late-successional characteristics. Although dense, uniform stands have been a part of the landscape, the amount and distribution of these stands now occurring in these LSRs is inconsistent with the range of natural conditions."* (USDA and USDI 1997, p. 36).
>
> *"The overall goal for management of the LSR is to protect, maintain, and create late-successional forest ecosystems which serve as habitat for late-successional and old-growth related species. Management treatments will strive to re-establish connectivity of that habitat in the least amount of time to maintain functional, interacting late-successional forest ecosystems"* (USDA and USDI 1997, p. 47).

The need for the action is also established in the Siuslaw Watershed Analysis, which includes a series of recommendations relevant to LSR management:

- silvicultural practices in the Riparian Reserves to accelerate development of large green trees, snags and coarse woody debris, multi-layered canopies, and increased

tree species diversity, and to restore large conifers where past management practices have resulted in hardwood-dominated riparian stands;

- thinning conifer stands to accelerate the development of large trees, killing trees to make snags and coarse woody debris, creating gaps and leaving understory trees to develop a multi-layer canopy, underplanting to develop a multi-storied canopy, and favoring species other than Douglas-fir, if available, to increase species diversity;

- creation of in-stream structures in the Siuslaw River and tributaries to improve aquatic habitat and hydrologic function;

- examination and replacement as needed of existing culverts to improve aquatic habitat and hydrologic function;

- road decommissioning or closure to improve terrestrial wildlife habitat, especially for elk (although the watershed analysis concludes that there is limited opportunity to reduce stream sedimentation by road decommissioning); and

- an integrated noxious weed control program to reduce noxious weed populations below levels that impair the viability of native species (USDI BLM 1996a, Chapter V, pp. 1-6).

Finally, the watershed analysis recommends:

> *"The next logical step toward ecosystem management in the Siuslaw Watershed is to look at ecosystem planning on a watershed scale. Such an endeavor could develop management for this geographic area in a way that ensures the biological integrity and sustainability of the Siuslaw Watershed."* (USDI BLM 1996a, Chapter V, p. 6).

Cooperating Agency

The U.S. Fish and Wildlife Service (FWS) is a cooperating agency in the preparation of this EIS because of their special expertise in threatened and endangered species: specifically here, the northern spotted owl and marbled murrelet. The FWS has been a part of the EIS interdisciplinary team (see Chapter 5) and has participated in the scoping process, the development of the alternatives, and the analysis of the environmental impacts.

Relationship to Policies, Plans, and Programs

All alternatives are in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (Northwest Forest Plan) (USDA Forest Service and USDI Bureau of Land Management, April 1994), and the *Eugene District Resource Management Plan* (RMP), as amended by the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA Forest Service and USDI Bureau of Land Management, January 2001). Under all alternatives, Survey and Manage surveys would be conducted as required consistent with survey protocols applicable at the time of the action, and known sites of Survey and Manage species would be managed consistent with the Management Recommendations applicable at the time of the action.

The Siuslaw River, which runs through the planning area, has been identified by the Oregon Department of Environmental Quality (ODEQ) as a "Water Quality Limited

Stream" for temperature and dissolved oxygen on its Draft 2002 303(d) list (Oregon Department of Environmental Quality 2003a, p. 117). Section 303(d) of the Clean Water Act requires each state to identify those waters which do not meet the state's water quality standards. BLM is a Designated Management Agency (DMA) with responsibility for maintaining the quality of waters on the 303(d) list that flow across the lands it manages. BLM will complete a Water Quality Restoration Plan (WQRP) in conjunction with the selected alternative. We will develop a water quality restoration plan in conjunction with the Record of Decision.

Possible conflicts between the alternatives and the objectives of other Federal, regional, State, and local land use plans, policies and controls are addressed in Chapter 4.

Authorizing Actions and Implementation

Most actions contemplated in the alternatives are entirely within the authority of BLM and require no additional authorization or permit. However, ODEQ water quality standards are applicable to many aquatic restoration projects, which may require permits prior to implementation.

All of the action alternatives in this EIS are designed to implement decisions in the Eugene District RMP and would not require any RMP revision or amendment for adoption. This EIS is intended to analyze actions in sufficient detail so that we could implement many of the actions without additional NEPA analysis, following an eventual Record of Decision on the restoration plan. We would implement each management action (or group of related actions) under the eventual restoration plan with its own Decision Record, prior to which we would conduct a "Documentation of Land Use Plan Conformance and NEPA Adequacy" (DNA) to determine whether additional NEPA analysis is necessary. The DNA itself is not a NEPA document, but is merely an interim step in the BLM internal analysis process. More information on DNAs can be found in BLM Instruction Memorandum No. 2001-062, which is available online at http://www.blm.gov/nhp/efoia/wo/fy01/im2001-062.html.

Where site-specific conditions differ or circumstances change from those described in this EIS, or if a DNA is inappropriate for other reasons, we may need to conduct additional NEPA analysis prior to reaching a decision to implement a management action. For example, replacement of a culvert with an unusually large amount of fill might require an Environmental Assessment (EA) to consider effects of sedimentation that might exceed that analyzed in this EIS, which used approximate averages (see Chapter 4, Issue 7). As another example, stand-specific conditions – such as extensive windstorm damage or root rot – might suggest a stand-specific thinning prescription different from those in the selected alternative. However, such instances are expected to be the exception. The eventual Record of Decision on the restoration plan will address the DNA process and the need for future NEPA analyses in the broader discussion of implementation of the selected alternative.

Decision Records for projects implemented under this restoration plan would include descriptions of the Best Management Practices and project design features that we would implement. In some alternatives, we would consistently employ certain Best Management Practices for certain types of actions; in those instances, we have incorporated the management practices into the description of the alternative as guidelines or mitigation measures (see Appendix A).

The Record of Decision for the restoration plan will include a monitoring plan and a discussion of adaptive management for implementation of the selected alternative. The monitoring plan will describe how we will evaluate whether the projects implemented are within the scope of the restoration plan, whether their impacts are within the

scope of the EIS, and whether the projects are achieving the anticipated results. The Record of Decision will also address how changes might be made through an adaptive management process based on monitoring results and changes in environmental conditions. We are not addressing monitoring and adaptive management here, because we will need to tailor the monitoring plan to a specific alternative, which will not be possible until the Record of Decision documents the selection of an alternative.

Issues

We developed the issues for analysis based on public scoping, interdisciplinary team discussion, and agency staff comments. The issues are summarized below and serve to focus the analysis and comparison of alternatives.

1. *How would road decommissioning and road management actions alter public access to BLM-managed lands?*
2. *How much new road construction would be needed to implement restoration actions?*
3. *What level of risk to existing late-successional forest would result from restoration activities?*
4. *How would thinning affect development of late-successional forest structural characteristics?*
5. *What are the effects of restoration activities on marbled murrelet habitat?*
6. *What are the effects of restoration activities on northern spotted owl habitat?*
7. *What are the effects of restoration activities on coho salmon habitat?*
8. *How would restoration activities affect the presence and spread of noxious weeds?*
9. *What would be the economic effects of restoration activities?*
10. *What are the costs of restoration?*

Issues considered, but not analyzed

- *What are the effects of restoration activities on air quality?*

  Several of the action alternatives would include activities which could affect air quality, including smoke from prescribed burning and dust from road use and construction. Given the minor amount and diffuse nature of these activities that would occur, none of the alternatives would have a significant effect on air quality, and the effects have been already analyzed in the EIS for the Eugene District RMP (USDI Bureau of Land Management 1994, pp. 4-10 - 4-14).

- *What are the effects of restoration activities on stream temperature?*

  The Siuslaw Watershed Analysis (1996) indicated that summer temperatures in the Siuslaw River itself are high, but that direct solar radiation is the factor with the greatest effect on water temperature (Siuslaw Watershed Analysis, pp. II-12, III-7).

All alternatives would maintain sufficient stream shading so as to avoid contributing to increased water temperature. Furthermore, the addition of large wood to streams in the action alternatives would provide stream shading, accumulate gravels, and create deeper pools, which would contribute to the cooling of stream temperatures. Therefore, all of the alternatives would either maintain or slightly cool stream temperatures in the planning area. The WQRP will address specific actions and monitoring features that pertain to maintenance of stream temperature.

- *What are the effects of restoration activities on dissolved oxygen in streams?*

  The effects of restoration activities on levels of dissolved oxygen in streams was not analyzed, because analysis of this issue at the landscape scale is largely impractical. Furthermore, it is reasonably foreseeable that water temperature itself has more effect on dissolved oxygen levels in streams in the planning area than would inputs of organic material associated with restoration activities over a 10-year period. However, because dissolved oxygen levels are identified in the draft 303(d) listing for the Siuslaw River, and the action alternatives would include activities which could affect biological oxygen demand, a brief discussion of this issue is provided below.

  Under all action alternatives, large quantities of fine organic material could be introduced into small streams, which could affect dissolved oxygen levels. Low dissolved oxygen levels in small streams could potentially adversely affect the survival and growth of salmonids and other aquatic-dependent species. However, the streams in which restoration actions would occur typically exhibit cool water temperatures, low biochemical oxygen demand (BOD), and rapid aeration rates. Forest streams, especially 1st and 2nd-order streams, are typically at or close to saturation of dissolved oxygen (DO).

  A few studies have indicated areas of low DO in low gradient streams which were loaded with logging debris that impounded the streams. Low DO levels in forest streams are most commonly associated with heavy inputs of fine, fresh organic material; high water temperatures; low stream gradient; very slow moving water; low stream flow; or areas where oxygen reaeration is poor. Although input of large quantities of fine organic material has the potential to increase BOD during low stream flow and high water temperatures, most forest streams have enough turbulence to maintain a high amount of DO in the water column, even during low flows.

  The WQRP will address specific actions and monitoring features that pertain to maintenance of dissolved oxygen levels.

- *What are the effects of restoration activities on peak flows in streams?*

  The planning area is of low elevation, and the watershed lacks any substantial areas in the transient snow zone in which rain-on-snow events are more likely (USDI BLM 1996a, p. 1-9). Therefore, there would be no discernible difference in how the different thinning regimes in the alternatives would affect the peak flows in streams. The Cottage Grove/Big River Watershed Analysis, for a watershed east of the planning area, provides a discussion of the effect of vegetation management in the transient snow zone on peak flows (USDI BLM 1997, pp. 3-16 - 3-18; 4-2 - 4-3).

- *What are the effects of restoration activities on red tree vole habitat?*

  Analysis of the specific effects on habitat for the red tree vole (which is a prey species for northern spotted owls) would be substantially similar to the broader analysis of the effects on northern spotted owl habitat, which is included in this EIS.

- *What are the effects of contract logging instead of selling timber?*

Some scoping comments urged BLM to contract directly the logging of stands to be thinned and sell the logged timber, rather than the more usual method of selling a timber sale at auction and having the purchaser arrange for the logging of the stand. This issue was not analyzed because the two methods do not differ in their environmental effects. Any specific methods or procedures that are identified for implementation of the selected alternative will be addressed in the eventual Record of Decision.

CHAPTER 2

The Alternatives

Introduction

Council on Environmental Quality (CEQ) regulations direct that an EIS shall "... rigorously explore and objectively evaluate all reasonable alternatives ..." 40 CFR § 1502.14. CEQ guidance further explains:

> *"When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the* full spectrum *of alternatives, must be analyzed and compared in the EIS."* ("Forty Most Asked Questions ..." 46 Fed. Reg. 18027 (Mar. 23, 1981)).

For a multi-resource activity plan, such as is proposed here, there are potentially endless variations in design features or combinations of different plan components. The range of alternatives analyzed in this EIS is intended to span the full spectrum of alternatives that would respond to the purpose and need for the action. The alternatives analyzed were developed to represent overall management approaches, rather than exemplify gradations in design features.

Furthermore, the alternatives analyzed here do not provide all possible combinations of plan components. There are components of the alternatives that are somewhat separable: upland forest silviculture, in-stream restoration, and road decommissioning, for example. We constructed the alternatives with the intent of including components most consistent with the overall management approach of the alternative. It is possible that the decision-maker might select a new combination of components in an eventual Record of Decision. Such a selection might be possible without further analysis if the analysis of the different components is sufficiently separable that the overall impacts of a new combination of components would be apparent.

Alternatives Analyzed in Detail

This EIS analyzes six alternatives in detail: the No Action alternative and five action alternatives. The following section provides a description of the overall management approach of each alternative and summarizes the actions (see Table 1). These summaries include the actions that we would implement during the 10-year span of this proposed plan, as well as reasonably foreseeable future actions under each management approach. Because terrestrial and aquatic restoration may take more than a century to achieve, it is important to analyze the long-term impacts of the alternatives, which requires some forecasting of future management actions beyond the 10-year span of this proposed plan. We make this forecasting only for the purpose of cumulative impact analysis, and we are not making any decision in principle to implement such future actions beyond the 10-year span of this proposed plan.

Appendix A provides a detailed description of the objectives, actions, guidelines, and mitigation measures for each action alternative for the 10-year span of the proposed plan.

Mitigation Measures

Mitigation measures are taken to make the effects of an action less harsh or severe. The CEQ regulations state that mitigation includes avoiding impacts, minimizing impacts, reducing impacts, or compensating for impacts (40 CFR 1508.20). We have incorporated mitigation measures into the design of each alternative, as described in the guidelines and mitigation measures in Appendix A.

Table 1

Summary of the major features of the alternatives

(treatments that would occur during the 10-year span of the proposed plan)

FEATURE	ALTERNATIVE A No action	ALTERNATIVE B Plantation and road management with no timber harvest	ALTERNATIVE C Continue current management approach
very young stands (≤20 years old) 2,900 acres	– no treatment	– thin 90% of acres – low-moderate density	– thin 100% of acres – moderate-high density – even spacing
young stands (21-50 years old) 8,700 acres	– no treatment	– thin 75% of acres – moderate-high density – variable spacing – no removals	– thin 5% of acres – low-moderate density – even spacing – thinning >40 years old
mid-seral stands (51-80 years old) 2,200 acres	– no treatment	– no treatment	– thin 20% of acres – low-moderate density – even spacing
riparian conifer stand treatment (<100' from streams)	– no treatment	– same as uplands	– no thinning <50' from stream
riparian hardwood stands 200 acres	– no treatment	– no treatment	– convert 5% to conifers
in-stream woody debris	– none	– none	– 56 structures/mile on 3.8 stream miles, including cabling
new road construction	– none	– none	– as needed
road decommissioning	– none	– all roads where legally possible	– roads delivering sediment to streams – roads in late-successional forest

ALTERNATIVE			
D	**E**	**F**	
T&E species recovery	**Reduce stand densities as quickly as possible**	**Multi-entry and multi-trajectory thinning**	**FEATURE**
– thin 90% of acres – low-moderate density – variable spacing	– thin 90% of acres – very low density – variable spacing	– thin 90% of acres – moderate-high density – even spacing	**very young stands (≤20 years old) 2,900 acres**
– thin 60% of acres – wide range of densities – variable spacing	– thin 75% of acres – very low density – variable spacing	– thin 48% of acres – wide range of densities – repeated thinnings	**young stands (21-50 years old) 8,700 acres**
– thin 20% of acres – wide range of densities – variable spacing – no thinning >60 years old	– thin 25% of acres – very low density – variable spacing	– thin 24% of acres – wide range of densities – repeated thinnings	**mid-seral stands (51-80 years old) 2,200 acres**
– moderate density – no removals	– same as uplands	– same as uplands	**riparian conifer stand treatment (<100' from streams)**
– convert 50% to conifers	– convert 75% to conifers	– convert 50% to conifers	**riparian hardwood stands 200 acres**
– 30 structures/mile on 3.8 stream miles, including cabling – 160 pieces/mile on all 1st and 2nd order streams	– 160 pieces/mile on all streams – no structures – no cabling	– 56 structures/mile on 3.8 stream miles, including cabling	**in-stream woody debris**
– temporary spurs only	– as needed	– as needed	**new road construction**
– roads delivering sediment to streams – roads in or adjacent to late-successional forest	– roads delivering sediment to streams – roads in or adjacent to late-successional forest	– roads delivering sediment to streams – roads in late-successional forest	**road decommissioning**

Features Common to All Alternatives

Under all alternatives, including the No Action alternative, we could continue to take management actions specifically required by the RMP or by law or policy. Such actions include, but are not limited to:

- wildfire suppression (see USDI BLM 1995, pp. 31, 105; USDA and USDI 1997, Appendix A, p. 1)
- salvage of dead trees following stand-replacing disturbance events exceeding 10 acres and posing a high risk of future large-scale disturbance (USDA and USDI 1994, pp. C-13 - C-16; USDI BLM 1995, p. 30; USDA and USDI 1997, p. 41).
- felling of hazard trees along roads and trails, and in campgrounds (USDI BLM 1995, p. 30, 31)
- maintenance of BLM-controlled roads
- construction of roads on BLM land by adjacent landowners, as authorized by existing road use agreements. Existing rights-of-way, contracted rights, easements, or use permits would be considered valid uses and would be designed to reduce adverse impacts on Late-Successional Reserves (USDA and USDI 1994, p. C-19; USDI BLM 1995, p. 32).

Additional management actions that are not directly related to the restoration purposes of this proposed plan would likely continue to occur within the LSR (e.g., research, recreation use, and land tenure actions). These actions are described by resource program in the RMP.

ALTERNATIVE A

No Action

No management actions, except those specifically required

This alternative would take no management actions to protect and enhance late-successional and old-growth forest ecosystems; to foster the development of late-successional forest structure and composition in plantations and young forests; or to reconnect streams and reconnect stream channels to their riparian zones and upslope areas. Only those management actions specifically required by the RMP or by law or policy would occur, as discussed above under “Features Common to All Alternatives.”

ALTERNATIVE B

Plantation and Road Management with no Timber Harvest

Restore plantations and roads and let nature do the rest

This alternative is designed to accomplish restoration without timber removal. It would thin Douglas-fir plantations, but not unmanaged stands. Because no cut trees would be removed, the risk of fire and insect infestation would constrain thinning prescriptions, except in very young stands.

Very young stands (≤20 years old) would be thinned to variable spacing at low to moderate densities.

Young stands (21-50 years old) would be thinned to variable spacing at moderate to high densities. Both very young and young stands would undergo subsequent coarse woody debris and snag creation treatments every 10-20 years. Shade-tolerant conifers would be planted at the time of subsequent coarse woody debris and snag creation.

Mid-seral stands (51-80 years old) would not be thinned.

Riparian areas (<100' from streams) which are conifer-dominated would be treated the same as upland stands. Riparian areas which are hardwood-dominated would not be treated.

No trees would be specifically felled or pulled into streams, and no in-stream structures would be constructed. All high-risk and fish-barrier culverts would be removed or replaced.

All roads would be decommissioned where legally possible. No new roads would be constructed.

ALTERNATIVE C

Continue Current Management Approach

Manage young stands using current silvicultural techniques and continue riparian restoration at the current pace of work

This alternative is designed to accomplish restoration using current silvicultural techniques and stream restoration strategies. Thinning would be concentrated in stands 41-80 years old and would have targets for moderate stand densities and relatively even tree spacing. Most cut trees would be removed from thinned stands to minimize the risk of fire and insect infestation.

Very young stands (≤20 years old) would be thinned to even spacing at moderate to high densities without any timber removal. A second thinning of the overstory would occur approximately 30 years later, which would require timber removal.

Young and mid-seral stands (40-80 years old) would be thinned from below to relatively even spacing at a range of densities, with some timber removal. Shade-tolerant conifers would be planted at the time of thinning. Coarse woody debris and snags would be created at the approximate time of thinning. There would be few if any subsequent treatments of thinned stands.

Riparian areas (<100' from streams) which are conifer-dominated would be treated the same as upland stands, but would not be thinned within 50' of streams. A small portion of the riparian areas which are hardwood-dominated would be thinned, and conifers would be planted at the time of thinning.

In-stream structures would be constructed, and some structures would be cabled for stability in larger streams. In-stream structures would include weirs, cascades, jetties, and/or ramp logs. These types of structures are described in detail in the Upper Siuslaw Aquatic Habitat Restoration Plan (EA OR090-EA-98-17), which is incorporated here by reference. Trees would be felled into smaller streams adjacent to thinning projects. All high-risk and fish-barrier culverts would be removed or replaced.

Non-shared roads capable of delivering sediment to streams, damaged roads not needed for future access, and roads that dead-end in late-successional stands would be decommissioned. New roads would be constructed as needed to access areas selected for thinning.

ALTERNATIVE D

T&E Species Recovery

Maximize the development of habitat for northern spotted owls, marbled murrelets, and coho salmon where possible with minimal impacts to existing habitat

This alternative is designed to take advantage of restoration opportunities that would have the least short-term adverse effects with the most long-term benefits to habitat for northern spotted owls, marbled murrelets, and coho salmon. Thinning would be concentrated in younger stands and would have targets for a wide range of stand densities and high variability of tree spacing. Some cut trees would be removed from thinned stands to reduce the risk of fire and insect infestation. All stand thinning requiring timber removal would be completed within the next 10 years, and subsequent treatments, such as tree planting and snag and coarse woody debris creation, would not require road access.

Very young stands (≤20 years old) would be thinned to variable spacing at low densities without any timber removal.

Young and mid-seral stands (21-60 years old) would be thinned to variable spacing at a wide range of densities with some timber removal. Shade-tolerant conifers would be planted at the time of thinning. Both very young and young stands would undergo subsequent coarse woody debris and snag creation every 10-20 years. Stands older than 60 years old would not be thinned.

Riparian areas (<100' from streams) which are conifer-dominated would be thinned from below without any timber removal. Thinned stands would undergo subsequent coarse woody debris and snag creation every 10-20 years. Shade-tolerant conifers would be planted at the time of subsequent coarse woody debris and snag creation. Approximately half of the riparian areas which are hardwood-dominated would be thinned, and conifers would be planted at the time of thinning.

In-stream structures would be constructed, and some structures would be cabled for stability in larger streams, similar to Alternative C. Trees would be felled into all streams adjacent to stands ≤80 years old. All high-risk and fish-barrier culverts would be removed or replaced.

Non-shared roads capable of delivering sediment to streams, damaged roads, and roads within or adjacent to late-successional forest, would be decommissioned. New road construction would be limited to temporary spur roads each less than 200 feet.

ALTERNATIVE E

Reduce Stand Densities as Quickly as Possible

Achieve tree densities typical of local late-successional forests as soon as possible

This alternative is designed to reduce stand densities as quickly as possible. Thinning would occur in all age classes ≤80 years old and would have targets for very low stand densities and high variability of tree spacing. Some cut trees would be removed from thinned stands to reduce the risk of fire and insect infestation. All stand thinning requiring timber removal would be completed within the next 10 years, and subsequent treatments, such as tree planting and snag and coarse woody debris creation, would not require road access.

Very young stands (≤20 years old) would be thinned to variable spacing at very low densities without any timber removal. Very young stands would require a subsequent thinning of the understory, approximately 20-40 years later, which would likely not require timber removal. Shade-tolerant conifers would be planted at the time of the second thinning. Very young stands would undergo subsequent coarse woody debris and snag creation, approximately 60 years after thinning.

Young and mid-seral stands (21-80 years old) would be thinned to variable spacing at very low densities with some timber removal. Shade-tolerant conifers would be planted at the time of thinning. Young stands might require a subsequent thinning of the understory, approximately 20 years later, which would not require timber removal. Young and mid-seral stands would undergo a single subsequent treatment for coarse woody debris and snag creation, approximately 20-50 years after thinning.

Riparian areas (<100' from streams) which are conifer-dominated would be treated the same as upland stands. Most riparian areas which are hardwood-dominated would be thinned, and conifers would be planted at the time of thinning.

Trees would be felled or pulled into all streams adjacent to stands ≤80 years old. No structures would be constructed, and woody debris would not be cabled for stability. All high-risk and fish-barrier culverts would be removed or replaced.

Non-shared roads capable of delivering sediment to streams, damaged roads, and roads within or adjacent to late-successional forest, would be decommissioned. New roads would be constructed as needed to access areas selected for thinning.

ALTERNATIVE F

Multi-entry and Multi-trajectory Thinning

Maintain stand vigor by increasing growing space, developing wind firmness, and maintaining crown development, while maintaining canopy closure

This alternative is designed to accomplish restoration using multiple thinning of stands to establish five different stand trajectories. Thinning would occur in all age classes ≤80 years old. Thinning entries would be designed to maintain moderate to high canopy closure, and would have targets for a range of stand densities. Most cut trees would be removed from thinned stands to minimize the risk of fire and insect infestation.

Very young stands (≤20 years old) would be thinned to even spacing at moderate to high densities without timber removal. The overstory would be subsequently thinned two to three times, approximately 20 years apart. Subsequent thinning beyond the 10-year span of this plan might include patch cuts. All subsequent thinnings would require timber removal. Shade-tolerant conifers would be planted at the time of the first subsequent thinning. Coarse woody debris and snags would be created at the approximate time of each subsequent thinning.

Young and mid-seral stands (21-80 years old) would be thinned from below at a wide range of densities, with timber removal. Shade-tolerant conifers would be planted at the time of thinning. The overstory would be subsequently thinned one to two times, approximately 20 years apart. Subsequent thinning beyond the 10-year span of this plan might include patch cuts. All subsequent thinnings would require timber removal. Coarse woody debris and snags would be created at the approximate time of each thinning.

Riparian areas (<100' from streams) which are conifer-dominated would be treated the same as upland stands. Approximately half of riparian areas which are hardwood-dominated would be thinned, and conifers would be planted at the time of thinning.

In-stream structures would be constructed on larger streams, and some would be cabled for stability, similar to Alternative C. All high-risk and fish-barrier culverts would be removed or replaced.

Non-shared roads capable of delivering sediment to streams, damaged roads not needed for future access, and roads that dead-end in late-successional stands would be decommissioned. New roads would be constructed as needed to access areas selected for thinning.

Identification of the Preferred Alternative

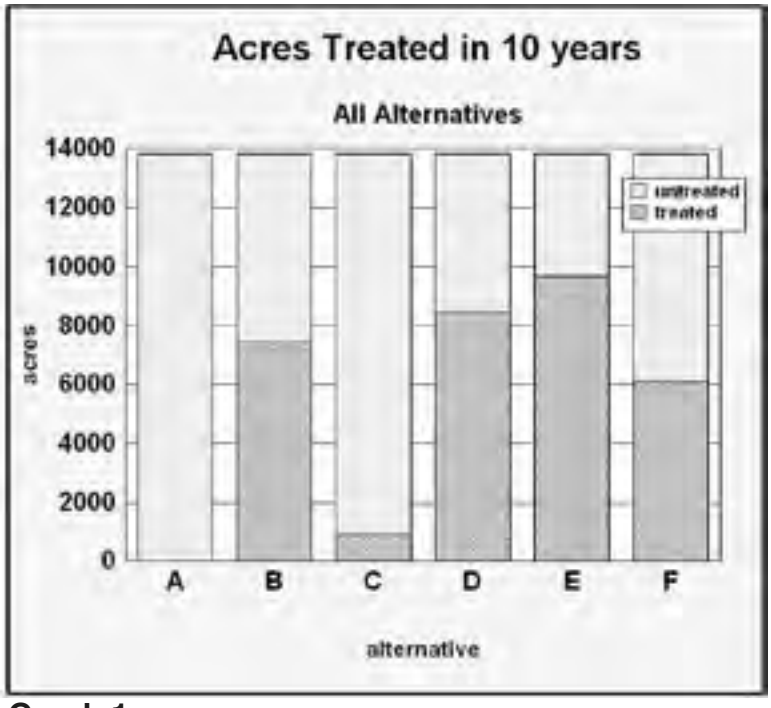
Several of the alternatives analyzed in detail would effectively fulfill our "... statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors" and thus be appropriate as the preferred alternative ("Forty Most Asked Questions ..." 46 Fed. Reg. 18027 (Mar. 23, 1981)). Nevertheless, BLM and the FWS identify Alternative D as the preferred alternative, because it would:

- effectively foster the development of late-successional forest structure;
- thin stands to a wide range of stand densities, which would maintain future management options;
- maintain the current amount of dispersal habitat for northern spotted owls;
- decommission the most damaging roads;
- moderate the risk of wildfire over time; and
- generate revenue greater than the costs, indicating the feasibility of implementing the overall restoration program.

The BLM and FWS preference among the alternatives may change in the Final EIS based on public comments, other agency comments, and any additional analysis that may be needed for the Final EIS.

Summary of Environmental Impacts

This section summarizes the analytical results that serve to highlight the differences among the alternatives (see Table 2). Chapter 4 describes in detail the environmental consequences of the alternatives and presents further comparison of the effects of the alternatives at the end of that chapter.



Graph 1

The proportion of stands currently ≤80 years old that would be thinned during the 10-year analysis period varies widely among the action alternatives. No more than 70% of these stands would be thinned under any alternative (see Graph 1).

Alternative A (No Action) would leave the existing road system intact and would generate no economic activity. Stands currently ≤40 years old would quickly become spotted owl dispersal habitat, but would not attain late-successional structure within the 100-year analysis period (see Table 2). Alternative A would not create any stable in-stream structure on larger (3rd-5th-order) streams.

Alternative B would decommission the greatest length of roads and build no new roads. It would not slow the development of spotted owl dispersal habitat. It would have limited effectiveness in speeding the attainment of late-successional forest

structure. Alternative B would not create any stable in-stream structure on larger streams. It would have no revenue and moderate costs.

Alternative C would decommission a small length of roads and would build a small amount of new roads. It would not slow the development of spotted owl dispersal habitat. It would not effectively speed the attainment of late-successional structure. Alternative C would create stable in-stream structure on larger streams only where accessible to heavy machinery. The revenues would be slightly lower than the costs.

Alternative D would decommission a moderate length of roads and would build a small amount of new roads. It would slow the development of spotted owl dispersal habitat (although it would always maintain the current amount). It would effectively speed the attainment of late-successional structure. Alternative D would create stable in-stream structure on more streams than any other alternative. The moderate revenues would exceed the costs.

Alternative E would decommission a moderate length of roads, but would build the greatest length of roads. It would slow the development of spotted owl dispersal habitat (and temporarily reduce it below the current amount). It would be the most effective at speeding the attainment of late-successional structure. Alternative E would create stable in-stream structure on a moderate length of larger streams. It would generate the most economic activity and would have the highest revenues, which would substantially exceed the costs.

Alternative F would decommission a small length of roads build a small amount of new roads. It would not slow the development of spotted owl dispersal habitat. It would have limited effectiveness in speeding the attainment of late-successional forest structure. Alternative F would create stable in-stream structure on larger streams only where accessible to heavy machinery. It would generate almost as much economic activity as Alternative E, and the high revenues would substantially exceed the costs.

Table 2. Summary of the effects of the alternatives

FEATURE	ALTERNATIVE					
	A	B	C	D	E	F
Road decommissioned (miles)	0	79	24	45	45	24
New road built (miles)	0	0	6.9	3.6	15.0	11.5
Stands that become owl dispersal habitat by 2022 (acres)	8,100	8,100	8,100	5,500	600	8,000
Stands that develop late-successional structure by 2097 (acres)	0	2,300	100	6,000	8,800	1,000
Stable instream structures created on 3rd to 5th order streams (miles)	0	0	3.8	8.2	5.8	3.8
Contracts (months of work)	0	298	69	236	384	383
Total revenue (millions of dollars)	0	0	2.8	11.6	20.2	12.7
Total costs (millions of dollars)	0	5.6	3.5	8.8	14.5	6.9

Alternatives Considered, but Eliminated from Detailed Analysis

An EIS for a multi-resource activity plan, such as that proposed here, need not analyze alternatives that are inconsistent with the existing management plans to which it is tiered (in this case, the Northwest Forest Plan and the RMP). In general, an EIS also need not analyze alternatives that are infeasible, ineffective (i.e., would not respond to the purpose and need for the action), or substantially similar to alternatives that are analyzed. Finally, an EIS need not analyze alternatives whose effect cannot be reasonably ascertained.

In developing this draft EIS, the following alternatives were considered as a result of internal or external scoping, but were eliminated from detailed analysis, as explained below.

1. No Action, with no wildfire suppression and no salvage

This alternative would conduct no management actions under any circumstances. Such an alternative would not be consistent with the Northwest Forest Plan and the RMP. The Northwest Forest Plan established that the goal of wildfire suppression in Late-Successional Reserves is to limit the size of all fires and directed the preparation of a fire management plan to guide wildfire suppression (USDA and USDI April 1994, p. C-18). The fire management plan for LSR 267 prepared as part of the LSR Assessment states that all wildfires will be suppressed (USDA and USDI 1997, Appendix A, p.1). To preclude wildfire suppression under any circumstances would be beyond the scope of this action and would not be consistent with the Northwest Forest Plan and the RMP.

The Northwest Forest Plan and the RMP provide detailed standards and guidelines for conducting salvage within LSRs, designed to prevent negative effects on late-successional habitat and facilitate habitat recovery following disturbance (USDA and USDI April 1994, pp. C-13 - C-16; USDI BLM 1995, p. 30). The proposed restoration plan does not specifically address salvage following future disturbances. The need for any such salvage would be evaluated following a specific disturbance, based on the guidance in the Northwest Forest Plan and the RMP. To preclude salvage under any circumstances would be beyond the scope of this action and would not be consistent with the Northwest Forest Plan and the RMP.

*2. Citizen's Alternative to the Northwest Forest Pl*an

This "alternative" to the Northwest Forest Plan was proposed by several environmental groups in March 2000 (http://www.onrc.org/programs/wforest/citizens.htm). None of the groups affiliated with this "Citizen's Alternative" specifically suggested it in the scoping for this EIS. Although the "Citizen's Alternative" does include a section related to restoration in young plantations, the "Citizen's Alternative" as presented on the website does not provide sufficient detail for analysis in this EIS. To the extent that the features of the "Citizen's Alternative" are evident, it appears that this alternative would be substantially similar to Alternative B. Although the "Citizen's Alternative" does not explicitly prohibit timber harvest (which Alternative B does), it provides such restrictive conditions for timber removal that they would likely constitute a de facto prohibition on timber removal in most stands, at least during the 10-year span of the proposed plan.

3. Extensive use of fire to thin stands

This alternative would use prescribed fire, rather than tree-cutting, to reduce the density of young stands. This alternative was not suggested in the scoping for this EIS, but has been suggested in comments on individual projects that preceded development of this EIS. This alternative would be impractical and ineffective at achieving the purpose of the action. In young, high-density plantations, such as predominate in the planning area, a fire hot enough to kill individual trees would likely become a crown fire and destroy the entire stand. Even in the unlikely circumstance that a prescribed fire could be used to reduce stand density without destroying the entire stand, fire would kill any understory shade-tolerant conifers within the stand. Therefore, an alternative that uses prescribed fire instead of tree-cutting would be ineffective at fostering the development of late-successional forest structure and composition in plantations and young forests. Additionally, use of prescribed fire in young plantations would entail a high risk of fire spreading to existing late-successional forest. Therefore, an alternative that uses prescribed fire instead of tree-cutting would be ineffective at protecting late-successional and old-growth forest ecosystems.

4. Heavy thinning without timber removal

This alternative would be somewhat similar to Alternative B, but would not include mitigations to reduce risk of wildfire and Douglas-fir bark beetle infestation. This alternative would also be somewhat similar to Alternative E, but without timber removal. Leaving such great quantities of cut trees on the ground would pose an unacceptable risk of wildfire and Douglas-fir bark beetle infestation and thus would be ineffective at protecting late-successional and old-growth forest ecosystems, and fostering the development of late-successional structural characteristics in young stands. For example, thinning 40-year-old stands with prescriptions similar to Alternative E would leave approximately 90 trees per acre >12” diameter at breast height (dbh) on the ground, which could result in subsequent mortality of the rest of the stand from bark beetle infestations and would pose a high risk to nearby late-successional stands. Without timber removal, such an alternative would lack the opportunity for adaptive management, such as adjusting the amount of wood left on the ground based on bark beetle population levels. Additionally, applying such prescriptions across the landscape without timber removal would result in half of the young stands in the very high risk fuel models, and more than half of the young stands in a high-risk fuel models for more than 40 years. This is substantially greater than the risk in the alternatives analyzed in detail.

5. Thinning stands >80 years old

An alternative that would include thinning in stands >80 years old would not be consistent with the Northwest Forest Plan and the RMP. The Northwest Forest Plan states that in LSRs, “There is no harvest allowed in stands over 80 years old ... Thinning (precommercial and commercial) may occur in stands up to 80 years old ...” (USDA and USDI April 1994, p. C-12; USDI BLM 1995, p. 30). Regardless of this prohibition, mature stands (81-200 years old) make up a very small portion of the planning area (approximately 9%), and the LSR Assessment and Siuslaw Watershed Analysis did not identify any need for treatment in these stands.

6. Clearcut high density stands and replant at lower densities

This alternative would be based on the assumption that high-density, even-aged stands cannot develop late-successional forest structure, even with thinning, and therefore regenerating the stands would be the only option to attain late-successional forest structure. This assumption is not consistent with the analysis for the Northwest Forest Plan (USDA and USDI February 1994, pp. 3&4-42 - 3&4-46), and an alternative

that would cut all of the trees in stands would not be consistent with the Northwest Forest Plan and the RMP. The Northwest Forest Plan provided for thinning and other silvicultural treatments beneficial to the creation and maintenance of late-successional forest conditions (USDA and USDI April 1994, pp. 8; C-12; USDI BLM 1995, p.30), but did not provide for the regeneration of existing stands. The LSR Assessment and Siuslaw Watershed Analysis did not identify any need for such drastic treatment of stands, and in fact highlighted the potential beneficial effect of thinning on existing, high-density stands (USDA and USDI 1997, pp. 34-41; USDI BLM 1996a, pp. V-1 - V-3).

CHAPTER 3

Affected Environment

Introduction

Several documents have analyzed the affected environment of the planning area. The Northwest Forest Plan FSEIS analyzed the regional ecosystem within the range of the northern spotted owl (USDA and USDI February 1994). The Northwest Forest Plan FSEIS relied in part on the report titled Forest Ecosystem Management: An Ecological, Economic, and Social Assessment (the FEMAT Report, USDA Forest Service et al. 1993), which was included as an appendix to the Northwest Forest Plan FSEIS. The FEMAT Report and the Northwest Forest Plan FSEIS describe the terrestrial and aquatic ecosystem conditions across the region, with particular emphasis on the amount and condition of existing late-successional forest; the ecological role of late-successional forests; and watershed conditions and processes. Those portions of Chapters 3&4 of the Northwest Forest Plan FSEIS (including the FEMAT Report attached in Appendix A) that describe terrestrial and aquatic ecosystem conditions and processes are incorporated here by reference.

The EIS for the Eugene District RMP (RMP EIS) further describes terrestrial and aquatic ecosystem conditions and processes for ecosystems typical of the Eugene District (USDI BLM 1994, pp. 3-14 - 3-62) and describes in detail special areas and special status species within the Eugene District (USDI BLM 1994, pp. 3-62 - 3-98). The RMP EIS also describes resource programs and facilities within the Eugene District (USDI BLM 1994, pp. 3-99 - 3-121) and the existing economic and social conditions in the general area (USDI BLM 1994, pp. 3-121 - 3-131). Those portions of Chapters 3 of the RMP EIS that describe the affected environment are incorporated here by reference.

The LSR Assessment details terrestrial ecosystem conditions and processes within LSR 267 and LSR 268, with particular emphasis on forest stand development and existing late-successional forest conditions (USDA and USDI 1997, pp. 8-20, 47-66). The LSR Assessment stresses the importance of the planning area for dispersal of species associated with late-successional forests (USDA and USDI 1997, p. 30). The LSR Assessment also includes a Fire Management Plan for the planning area (USDA and USDI 1997, Appendix A). The Siuslaw Watershed Analysis details terrestrial and aquatic ecosystem conditions and processes within the Siuslaw River fifth-field watershed (USDI BLM 1996a). The Siuslaw Watershed Analysis includes a stream-by-stream analysis of current fish habitat conditions (USDI BLM 1996a, pp. II-38 - II-47). The LSR Assessment and Siuslaw Watershed Analysis are incorporated here by reference.

Since the LSR Assessment and Siuslaw Watershed Analysis were completed, BLM has conducted some additional surveys, analysis, and management actions in the planning area. This new information, which is summarized below, is not significant relative to the analytical conclusions or recommendations in the LSR Assessment or Siuslaw Watershed Analysis and is not significant relative to the decisions in the RMP. Therefore, there is no need to conduct an additional LSR Assessment or an additional iteration of the watershed analysis, and there is no need to consider an RMP amendment for Late-Successional Reserve or aquatic management at this time.

Roads

BLM maintains approximately 169 miles of road on BLM-managed land in the planning area, for a total road density of 4.4 miles of road for every square mile of land. Approximately 75 miles of these roads provide “legal public access”, according to the BLM Facility Inventory Maintenance Management System. “Legal public access” is

defined as either (a) roads for which BLM has acquired a public easement across private land; or (b) roads that begin on BLM-managed land that is legally accessible from state or county roads.

Figure 2. *The road inventory found 65 miles of road capable of delivering sediment to streams.*

Over the past decade, large timber companies have increasingly closed their land to public access, partly in response to littering, vandalism, and inappropriate vehicle use. This trend is likely to continue and could increase the importance of the existing public access within the planning area.

In 2002, BLM completed a road inventory of the planning area. Approximately 2.5 miles of road has been decommissioned in the planning area since the analysis conducted for the Siuslaw Watershed Analysis. The road inventory lists approximately 12 miles of road that are "passively" decommissioning (i.e., the road has become impassable over time because of lack of maintenance and traffic).

The Siuslaw Watershed Analysis estimated that road-related sedimentation represents only an approximately 5% increase over natural background levels (USDI BLM 1996a, pp. II-7 - II-8). The 2002 road inventory identifies approximately 65 miles of road on BLM-managed lands in the planning area that are capable of delivering fine sediments to streams (see Figure 2). Furthermore, approximately 10% of these road segments are not experiencing any traffic and are "passively" decommissioning, but still erode sediment from the road prism.

The road inventory also identifies approximately 73 culverts on BLM-controlled road segments that are currently at high risk for failure because of undersized culverts and plugged culverts. The ratings used to determine high risk included the risk to fish streams and high numbers of at-risk culverts along a road segment.

Fire and Fuels

The majority of stands 80 years old in the planning area are currently in an understory short shrub fuel model (63%); smaller portions are in a tall shrub model (21%) and a dense timber stand model (16%). See Chapter 4, Issue 3, for a description of the fuel models.

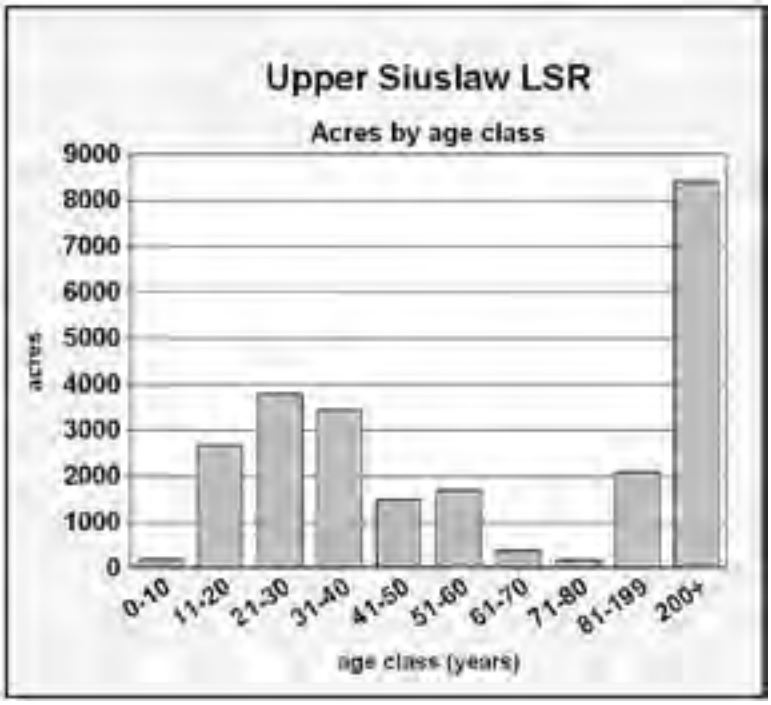
Fires within the planning area are rare: the fire occurrence from 1985-2001 was only 0.07 fires occurring per 1,000 acres per year, resulting in a total of 35 acres burned. Escaped slash burns have been the most common source of ignition. However, large fires are possible in the planning area: the Oxbow fire in 1966 burned approximately 42,000 acres (USDI BLM 1996a, p. II-33; USDA and USDI 1997, p. A-1). The Fire Management Plan of the LSR Assessment provides additional information on fire management (USDA and USDI 1997, Appendix A).

Forest Management

Prior to the establishment of LSRs by the Northwest Forest Plan, the intended silvicultural pathway for the stands in the planning area was a commercial thinning at age 35-45 years, and a final (clearcut) harvest at age 60-80 years. This silvicultural regimen was designed to produce high-density, single-aged stands of Douglas-fir to maximize the commercial value of timber produced. This effort was largely successful, and the resulting plantations are dense, uniform stands that are structurally quite different from natural stands in the planning area.

More than half of forest stands in the planning area are ≤80 years old (see Graph 2 and Map 8). Almost all stands in the planning area <60 years of age have been regenerated following timber harvest, and most have been either seeded or planted, and then pre-commercially thinned. Timber harvest in the planning area began as early as the 1940s. The predominant silvicultural system used at the time was a "seed tree" system, in which a few scattered trees were left to naturally reseed the harvest area. In the planning area, seed trees were usually cut once the new stand was established. From the 1960s to the 1990s, timber harvest largely shifted to a clearcut system, in which all trees within the harvest area were cut at once. Site preparation typically included burning of slash to control brush and create planting spots for new trees. The harvest area was then artificially seeded or planted with tree seedlings, which were almost always exclusively Douglas-fir. Trees were usually planted at very high densities (440-680 trees per acre (TPA)).

Most young plantations in the planning area were pre-commercially thinned (PCT) at age 10-20 years old to standardize the tree stocking levels and remove less desirable tree species. Most plantations were thinned to a 12' by 12' spacing (300 TPA) of Douglas-fir, generally cutting all competing species. Since 1990, PCT within the planning area has shifted to wider spacing, usually 17' by 17' (150 TPA), leaving many hardwoods and conifers other than Douglas-fir.



Graph 2

BLM has sold two timber sales in the planning area since 1994: the Smith Creek thinning and the Fawn Creek Forest Management Project. The Smith Creek thinning, completed in 2000, thinned 14 acres of 26-year-old trees in a progeny test site located in Section 13, Township 20 South, Range 6 West. Management of the progeny test sites is part of continuing long-term forest genetics research, described in the Forest Genetics appendix to the RMP (USDI BLM 1995, pp. 261-263). Additional information can be found in Environmental Assessment (EA) OR090-98-21. The Fawn Creek Forest Management Project, located in Section 17, Township 20 South, Range 5 West, includes approximately 150 acres of density management thinning. BLM sold the timber sale portion of this project in 2001, but the stand has not yet been logged. Additional information can be found in EA OR090-01-21 (http://www.edo.blm.gov/nepa/eas/fawncreekea.pdf).

Between 1994 and 2000, BLM pre-commercially thinned additional young stands

within the planning area. BLM pre-commercially thinned a total of 2,778 acres at the following spacing:

540 acres	13' x 13' (260 TPA)
403 acres	14' x 14' (220 TPA)
154 acres	15' x 15' (190 TPA)
1,390 acres	17' x 17' (150 TPA)
291 acres	20' x 20' (110 TPA)

In 1998, BLM created snags by both topping and girdling in a stand of 130 acres in Section 11, Township 20 South, Range 7 West. Four snags per acre were created around a co-dominant tree, which was thus released from competition.

In 1999 and 2000, BLM released individual trees in young plantations from competition by cutting all of the trees 30'-40' from a selected tree. Total treatments in young stands covered 770 acres in Sections 1, 11, 12, 13, and 14, Township 20 South, Range 7 West, and Section 35, Township 19 South, Range 7 West. Additional information can be found in EA No. OR090-98-31.

In Fall 2001 and Spring 2002, BLM thinned three one-acre plots to demonstrate probabilistic ("Monte Carlo") selection methods in a 28-year-old plantation in Section 31, Township 20 South, Range 5 West. Additional information can be found in the Categorical Exclusion review (CE) OR090-02-16, which is available online at http://www.edo.blm.gov/nepa/ces/montecarlo2CE.pdf.

Northern Spotted Owl and Marbled Murrelet

In 1992, the FWS designated lands considered to be critical spotted owl habitat; these lands were encompassed in a series of critical habitat units (CHUs) (USDI Fish and Wildlife Service 1992a) (see Figure 3). Critical habitat, as defined by the FWS, includes roosting, nesting and foraging habitat (also called "suitable" habitat) for resident owls, and dispersal habitat for non-resident owls seeking an unoccupied territory. The entire planning area is within critical habitat for the northern spotted owl, and contains portions of two Critical Habitat Units: approximately one-third of CHU OR-53 and a very small amount (3%) of CHU OR-52 (see Map 9). The LSR Assessment provides additional information on habitat conditions and the location of the Critical Habitat Units (USDA and USDI 1997, pp. 22-23; Map 14; Appendix H).

Figure 3. *The LSR Assessment highlights the importance of the planning area for dispersal of late-successional forest species, including the northern spotted owl.*

Approximately 43% of the planning area (10,600 acres) is currently suitable habitat for the northern spotted owl (see Map 9). Only stands >80 years old are considered suitable habitat here. (On a stand-specific basis, some younger stands are considered suitable habitat for the purpose of project-level consultation if they contain sufficient late-successional forest characteristics to provide nesting, foraging, and roosting habitat.)

Approximately 60% of the planning area is currently dispersal habitat for the northern spotted owl. Of all lands within the planning area boundary (including private lands), approximately 40% of the total acreage is currently dispersal habitat.

Fourteen historical northern spotted owl sites have been located in the planning area since 1980. Since 1997, spotted owls have been found to reside in nine of these sites. The barred owl population has increased in the same time period, and barred owls now inhabit at least four of these sites. Habitat fragmentation is high due to past harvests on federal land and ongoing timber harvest on private lands. Only one spotted owl site has greater than 40% suitable habitat within its home range (the U.S. Fish and Wildlife Service considers owl sites to be at risk when they contain less than 40% suitable habitat within a home range delineated by a 1.5 mile radius).

The planning area is approximately 34-45 miles from the Pacific coast, which is near the 50-mile limit of expected marbled murrelet distribution in Oregon (USDA Forest Service et al. 1993, pp. IV-15 - IV-17). BLM has conducted marbled murrelet surveys since 1997 in stands proposed for thinning treatments. Marbled murrelets have been observed at three locations in the planning area: over a stand in Section 7, Township 20 South, Range 5 West, in Section 17, Township 20 South, Range 7 West, and under the canopy in a stand in Section 1, Township 20 South, Range 7 West. The last observation was an incidental sighting (i.e., not part of a survey effort), but meets the definition of an occupied site ("birds flying below, through, into, or out of the forest canopy within or adjacent to a site of potential habitat") (Evans Mack et al., 2002). Further surveys in all of these areas resulted in no additional observations.

Coho Salmon and Aquatic Restoration

Coho salmon in the planning area appear to be maintaining their populations, but we cannot make any strong conclusions, because there have been few population and spawning surveys. In the adjacent Wolf Creek watershed, juvenile smolt trapping since 1995 has shown a steady increase in coho salmon, chinook salmon, and cutthroat trout populations.

The hydrology and aquatic and riparian habitat conditions are described in detail in the Watershed Analysis and the Upper Siuslaw Aquatic Habitat Restoration Plan (EA OR090-98-17), which is incorporated here by reference. The geology of the planning area is dominated by sedimentary oceanic deposits of siltstone and sandstone which have little capability to store or transport water. Because of the limited water storage capacity, stream flows are closely tied to precipitation patterns. Without adequate in-stream structure, stream channels have downcut through valley floor deposits. The Siuslaw River has downcut to bedrock along many reaches, causing an increase in channelization and secondary confinement of the flow, increasing velocities during peak flows and reducing habitat diversity. The majority of current riparian forests in the planning area are ≤80 years old, and riparian forests generally mirror the age-class distribution of the uplands.

The Watershed Analysis found that the salmon spawning and rearing habitat is limited in the planning area. Spawning gravels are usually located at the mouths of tributaries. The best remaining coho salmon habitat is mostly in the western portion of the planning area, in Haight, Bear, and Oxbow Creeks (see Map 10)

The Siuslaw Watershed Analysis details the condition of the Siuslaw River and its tributaries in the planning area. Both the Siuslaw River and many of its tributaries lack large woody debris to form adequate structures for fish cover, rearing, and spawning habitat. The watershed analysis recommends habitat creation through the placement of in-stream structure, and notes that the removal of barrier culverts could provide opportunity for aquatic species to reach otherwise suitable habitat. As noted above, the watershed analysis estimated that road-related sedimentation represents only an approximately 5% increase over natural background levels and concluded that road sediment delivery can be considered to be low and have no significant impact to the Siuslaw stream channel system (USDI BLM 1996a, pp. II-1 - II-8).

Aquatic enhancement efforts in support of the watershed analysis recommendations are ongoing. In 1998 and 1999, BLM placed hundreds of tons of boulders in a control location within the Siuslaw River channel to simulate six "cascades." The objectives of this type of structural installation included building up the confined, bedrock-dominated river channel and creating the potential for groundwater recharging (replenishing groundwater reservoirs), connecting the river and the adjacent flood plain, and increasing the structural complexity of the Siuslaw River and tributaries. Additional objectives included creating deep pools for fish cover, improving the availability of spawning, rearing and refuge habitat, and increasing the water-retention capacity in the upper basin during the low-flow summer months.

In 2000 and 2001, BLM focused aquatic restoration efforts on removing migration barriers to make additional habitat available to aquatic species in the following Siuslaw River tributaries: Oxbow Creek and tributaries; Frying Pan Creek and a tributary; Bear Creek; Haight Creek; Dogwood Creek; and Buck Creek. Six barrier culverts were removed and replaced with passage-friendly culverts, one barrier culvert was completely removed, and a stream enhancement project in Frying Pan Creek placed logs and boulders as key structural habitat features. These projects opened approximately 8.5 miles of usable stream habitat to aquatic species. Surveys in spring 2002 found that all of the barrier replacement culvert projects are allowing passage of either adult or juvenile coho salmon. The surveys did not find coho juveniles at the culvert removal site, but did observe juvenile and adult cutthroat in the general project location and in upstream habitats.

Five major tributaries of the Siuslaw River within the planning area currently have adequate woody debris to provide stable in-stream structures on 3rd-5th-order streams: Oxbow Creek, Doe Hollow, Dogwood Creek, Russel Creek, and Fawn Creek (see Map 10). Based on stream habitat surveys, BLM fish biologists have determined that 25 of the 45 miles of 3rd-5th-order streams in the planning area are a high priority for aquatic restoration efforts. Of these priority streams, approximately 12 miles currently have adequate woody debris. Of the remaining 13 miles that lack sufficient woody debris, only 3.8 miles are accessible by heavy equipment to perform in-stream restoration work (see Map 10).

The road inventory conducted in 2002 identifies culverts on both BLM and non-BLM-controlled roads within the planning area that affect the migration patterns of anadromous fish and resident fish, and aquatic organisms that historically utilized upstream habitat managed by BLM. The road inventory recommends either removal or replacement of 10 of 16 culverts on BLM-controlled roads. These barrier culverts on BLM-controlled roads impact 7.0 miles of usable coho habitat and 3.1 miles of steelhead and cutthroat habitat. The road inventory found seven culverts owned by Lane County and two privately-owned culverts that are potential barriers to aquatic species movement. Six of the seven county-owned culverts are near the confluences of major tributaries to the Siuslaw River and impact 15.0 miles of coho habitat. The two privately-owned culverts are partial barriers and impact 2.0 miles of coho habitat and 0.4 miles of steelhead and cutthroat habitat.

Noxious Weeds

A District-wide inventory of noxious weed infestations conducted in 1996 found approximately 48 miles of roadside noxious weed infestations within the planning area. Monitoring in the form of noxious weed roadside surveys, botanical surveys, and monitoring related to other resource projects within the planning area continues to document the presence of noxious weeds, particularly Scotch broom.

BLM has implemented noxious weed control projects in the planning area primarily in the southeast portion to control roadside Scotch broom (cutting, pulling and grubbing), and meadow knapweed (pulling and grubbing). BLM has conducted 22 miles of roadside treatments for Scotch broom since 1996, and will likely need to conduct recurring treatments to manage noxious weeds (see Figure 4).

In addition to these roadside treatments, BLM has conducted Scotch broom cutting incidentally, in conjunction with reforestation vegetation management treatments (e.g., pre-commercial thinning, brush control), as required by BLM policy.

Figure 4. *Noxious weed control projects have included cutting Scotch broom along roadsides.*